



Information centre

Conducted by Peter Phillips



Copyright, valves and suggestions

Anxious to make your fortune in electronics? Perhaps you might be able to plagiarise an idea from EA to help you on your way. But is it legal? That's one of the topics this month. There's also a short dissertation on TTL to CMOS interfacing, with a few reader comments on how we should check circuits presented to us for publication.

It's funny how projects from the past keep cropping up. This month it seems the emphasis is on the older projects, even as far back as 1951! Still, regardless of when the project, or circuit, was published, it's fair game for this section.

We generally seem to get more mail concerning older projects compared to that for the more recent ones, which suggests one of two possibilities: the new ones don't give any problems, or the new ones aren't being built. I suspect there is a combination of the two, with readers taking a conservative approach towards the latest projects by waiting to see how much errata is generated.

And that's the function of this section – to alert you to any difficulties that other constructors have encountered. But we need a few pioneers to feed us with the bad (or good) news. So don't keep your problems to yourself, share them with us and all the other readers. That is, your *technical* problems anyway...

Are projects patented?

The question of whether magazine projects, or sections thereof are subject to copyright is an interesting one and has been prompted by a letter from a reader who wishes to remain anonymous. Fair enough, it's an issue that seems to evoke an air of secrecy. The letter, duly edited to retain the anonymity requested is as follows:

I am interested in developing a marketable item that uses a certain section of a project described in EA. Are magazine projects subject to copyright, or may I use any or all of the ideas contained within them? (anon)

The short answer is that the circuit techniques used in Electronics Australia are effectively 'Public Domain', once they have been published. However, let's just expand on that, because there are some things that you *aren't* free to use.

For example, the text and diagrams associated with a project or any article are subject to copyright, and may only be used with the publisher's permission. This applies whether you intend to use the material to make money or otherwise. We are often quite happy to give permission to individuals wishing to use material in the magazine, but we need a written request and you need our written reply.

Some projects are presented with certain sections withheld, for example the PCB artwork. Projects of this kind are usually offered to the magazine by a kit supplier, who is keen to retain sole rights to the project. If a third party decides to sell such a kit he runs the possible risk of legal action by the original developer, although the magazine would not be involved.

This sometimes raises the vexing question of whether a developer would do better marketing his project without publishing it. It may be that the idea is so good a fortune could be realised by marketing it privately. A magazine such as EA will only pay a fixed amount, whereas a good project might catch on and be a commercial winner. Then again it may not.

There's one more thing. If you plan to market kits or assembled units for projects such as our 'Playmaster' series of amplifiers, you must use the parts and circuit configuration specified, if

you are to use our 'Playmaster' name. Otherwise you'll have to sell it under your own name, if you make changes.

But apart from these qualifications, if you think our projects have circuit ideas that could make you a million then go for it. Just don't tell us when you buy your own island in the South Seas – we might get a little jealous!

A bad design?

The next correspondent raises quite a few points in a letter that has a fairly severe tone to it. The letter is in response to a previous letter concerning problems with a VZ-300 RAM expansion circuit, presented as long ago as May 1987 in our 'Circuit and Design Ideas' section. Although the circuit in question is now somewhat dated, the points raised are interesting. Here's the letter, in reduced form.

The VZ-300 RAM expansion circuit presented in the Circuit and Design Ideas (EA May 1987) section has two glaring faults. The first is that the Z80 CPU, as used in the VZ-300 has TTL level output voltages, that is, less than 0.8V (low) and greater than 2.4V (high), whereas the CMOS logic gates used in the circuit have CMOS level inputs less than 1V (low) and greater than 4V (high). Because of the incompatibility of the logic families used, it is probable the circuit will not operate correctly.

Secondly, the propagation delay of 300ns for the 4008 adder would be likely to create problems, due to the access time of the VZ-300.

Might I suggest that when checking computer circuits for feasibility, you check particularly the following points.

1. Correct pinouts of ICs.
2. Correct Boolean logic.
3. Logic family compatibility.
4. Propagation delays.

Clearly, the third and fourth points have been overlooked in the circuit, and I doubt if the designer ever actually tested his design or perhaps he got lucky with a very fast 4008 in his prototype.

Might I also suggest that you request a

declaration from contributors stating that they have tried the circuit presented to save problems such as these. (M.S., Clarence Park A)

OK, the circuit referred to by M.S. is now over two years old, and delving back to it is not really going to prove anything. The reason I have published the letter is to be able to air the technical aspects of interfacing logic families, and to answer the suggestions by the correspondent on how we should check circuits presented for our Circuit and Design Ideas (CDI) section.

Examining various data books on the subject, I have to agree with M.S. concerning the likely incompatibility problems with interfacing a TTL-compatible IC to a CMOS type. The problems will arise when the TTL device goes high, and it is usual to include a pull-up resistor from the output to the 5V rail to get as high an output level from the TTL device as possible.

However, my own experience has demonstrated that most TTL compatible ICs (such as the Z80) will produce an unloaded output level of around 3.5V when the output is high. Most CMOS inputs will also recognise an input voltage of 2.5V or more as being a logic 1. So while the data books state certain limits, in practice one can often get away with interfacing TTL directly to CMOS. The simple answer is to add the pull-up resistors, which can be any value from 1k to 10k, although 2.2k is a typical value.

Propagation delays are another variable, and the times specified by manufacturers are always worst case. It often happens that CMOS ICs from one manufacturer will have different specifications to those from another, and generalising is often very misleading. For example, the Fairchild manual gives a typical propagation delay for the 4008 (at 5V) as 150ns, and 300ns as the maximum.

What I am trying to say is that I believe the circuit referred to by M.S. has every chance of working, although it does break 'good design' rules. So if I had applied the criteria suggested by M.S., this circuit would have passed my inspection, on the basis that I would not be prepared to reject it as technically inoperable because it breaks a few rules.

Then again, how on earth would we have the time to analyse all circuits presented by contributors for our CDI section, using the criteria suggested by M.S.? These circuits are presented with the disclaimer that we have not tested them - a sort of 'buyer beware' clause.

Our main concern is whether the circuit is likely to be of interest to other readers. Sorry M.S., we cannot abide by your suggestions as many excellent circuit ideas would never be printed.

Finally, I doubt if a signed declaration by contributors confirming that they have tested their circuit would solve anything. All the signing in the world simply means the prototype worked, which may be the result of good luck, or it may mean considerable research to ensure repeatability has been undertaken - who knows? Also, I question whether contributors would bother to dream up a circuit that they never actually built and submit it for publication anyway. We take the attitude that most contributors are honest, and our disclaimer takes care of the rest.

Vocal canceller

This project goes back a few years, but a reader who has recently built it seems to be having a few problems. His letter is as follows:

I recently completed the Vocal Cancellation project described in EA April 1982. Although everything else works, it does not seem to cancel the voice as described in the magazine. I have changed various components, including IC1, but when tested from a tape recorder, as described in the article, the voice is not cancelled.

Our resident audio expert Rob Evans has provided me with the following response:

To test the operation of the vocal canceller, short the left and right inputs to ensure that a true mono signal is applied to IC1. Then apply an audio signal or test tone to one of the inputs, and adjust the 'null' control RV1. Since the unit cancels any common mode signal, you should be able to eliminate the sound at the output or reduce it to a very low level.

If this is not the case, remove the input short and check the components between the input connections and pins 2 and 3 of the IC. Also, double check that both inputs are arriving from your amplifier, by switching the canceller to 'normal' mode and verifying that both the left and right outputs are present.

Valve suppliers

We occasionally get letters asking us where valves might be purchased. The following letter is typical, and the reply may be useful if your trusty valve amplifier or transmitter has finally died.

Could you advise me where I could obtain an 807 beam power valve. I have a

SBS RADIO & TV LISTING.

In the January 1989 issue of *Electronics Australia* we published a listing of all the Radio and Television stations in Australia. However, the Special Broadcasting Services' listing (better known as SBS TV & Radio), was inadvertently left out. It is as follows. We will also be publishing an updated version of all Radio and Television stations in the January 1990 issue.

SBS TV-STATIONS

Call	Location	Freq. (MHz)	Power Watts
ACT			
SBS28	Canberra	527.260	200K
SBS/54	Tuggeranong	709.250	400
SBS/58	Tuggeranong	737.250	750
NSW			
SBS28	Sydney	527.250	300K
SBS/32	Wollong. Nth	555.250	2.5K
SBS45	Newcastle	646.250	300K
SBS53	Illawarra	702.224	600K
SBS/58	Cooma	737.260	100
SBS/58	Gosford	737.198	200
SBS/58	Goulburn	737.260	500
SBS/58	Kings Cross	737.250	1K
VIC			
SBS28	Melbourne	527.250	300K
SBS/51	Upwey	688.224	160
SBS/58	Marysville	737.250	10
SBS/58	Warburton	737.250	150
SBS/68	Ferntree Gully	807.224	350
SBS/69	Selby	814.198	500
QLD			
SBS28	Brisbane	527.224	300K
SBS/48	Curumbin	667.250	2K
SBS/61	Gold Coast	758.250	50K
SA			
SBS28	Adelaide	527.224	300K
SBS/43	Adl. Foothills	634.224	2K
WA			
SBS28	Perth	527.198	300K
TAS			
SBS28	Hobart	527.224	225K

SBS RADIO

Call	Location	Freq. (kHz)	Power Watts
NSW			
2EA	Sydney	1386	5000
2EA	Newcastle	1584	150
2EA	Wollongong	1485	150
VIC			
3EA	Melbourne	1224	5000